

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/AU03/00746

|  |   |  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
|--|---|--|-----|--|---|-----|---|--|-----|---|--|-----|--|---|-----|--|--|
| <b>A. CLASSIFICATION OF SUBJECT MATTER</b>   |   |  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| Int. Cl. ?: C12N 15/10; C12Q 1/68  |   |  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| According to International Patent Classification (IPC) or to both national classification and IPC  |   |  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| <b>B. FIELDS SEARCHED</b>  |   |  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| Minimum documentation searched (classification system followed by classification symbols)<br><b>IPC (WPIDS) AND CHEMICAL ABSTRACTS</b>   |   |  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched<br><b>SEE BELOW</b>  |   |  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)<br><b>WPIDS, CA, MEDLINE</b>  |   |  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>  |   |  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| Category*  | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No.  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| X  | Electrophoresis, 2001, vol. 22, no. 2, Katsura et al., "Indirect micromanipulation of single molecules in water-in-oil emulsion", pages 289-93                      | All  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| X  | Chemical Abstracts, abstract accession no. 138:67155 (and Bio Industry, 2002, vol. 19, no. 8, Katsura, "PCR Amplification of single DNA molecule", pages 36-42)     | All  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| P,X  | Journal of Biotechnology, 2003, vol. 102, Nakano et al, "Single-molecule PCR using water-in-oil emulsion", pages 117-124  | All  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C  |   | <input checked="" type="checkbox"/> See patent family annex  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| <p>* Special categories of cited documents:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 2px;">"A"</td> <td style="width: 10%; padding: 2px;">document defining the general state of the art which is not considered to be of particular relevance</td> <td style="width: 60%; padding: 2px;">"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td style="padding: 2px;">"E"</td> <td style="padding: 2px;">earlier application or patent but published on or after the international filing date</td> <td style="padding: 2px;">"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td style="padding: 2px;">"L"</td> <td style="padding: 2px;">document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td style="padding: 2px;">"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td style="padding: 2px;">"O"</td> <td style="padding: 2px;">document referring to an oral disclosure, use, exhibition or other means</td> <td style="padding: 2px;">"&amp;" document member of the same patent family</td> </tr> <tr> <td style="padding: 2px;">"P"</td> <td style="padding: 2px;">document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table> |   |  | "A" | document defining the general state of the art which is not considered to be of particular relevance | "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention | "E" | earlier application or patent but published on or after the international filing date | "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone | "L" | document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art | "O" | document referring to an oral disclosure, use, exhibition or other means | "&" document member of the same patent family | "P" | document published prior to the international filing date but later than the priority date claimed |  |
| "A"  | document defining the general state of the art which is not considered to be of particular relevance  | "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| "E"  | earlier application or patent but published on or after the international filing date   | "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone   |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| "L"  | document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| "O"  | document referring to an oral disclosure, use, exhibition or other means  | "&" document member of the same patent family  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| "P"  | document published prior to the international filing date but later than the priority date claimed  |  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| Date of the actual completion of the international search<br>16 September 2003   | Date of mailing of the international search report<br>26 SEP 2003   |  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |
| Name and mailing address of the ISA/AU<br><b>AUSTRALIAN PATENT OFFICE<br/>PO BOX 200, WODEN ACT 2606, AUSTRALIA<br/>E-mail address: pct@ipaaustralia.gov.au<br/>Facsimile No. (02) 6285 3929</b>   | Authorized officer<br><b>CHRISTOPHER LUTON<br/>Telephone No : (02) 6283 2256</b>  |  |     |  |   |     |   |  |     |   |  |     |  |   |     |  |  |

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| <b>C (Continuation).</b> DOCUMENTS CONSIDERED TO BE RELEVANT |   |                              |
|--|---|------------------------------|
| <b>Category*</b>   | <b>Citation of document, with indication, where appropriate, of the relevant passages</b> | <b>Relevant to claim No.</b> |
| P,X  | JP 2003-153692 A2 (KATSURA et al.) 27 May 2003  | All                          |
| P,X  | WO 02/103011 A2 (MEDICAL RESEARCH COUNCIL) 27 December 2002. See page 43, lines 1-2       | All                          |
| A  | WO 99/02671 A2 (MEDICAL RESEARCH COUNCIL) 21 January 1999                                 | All                          |

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### Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos :  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos : **1-4, 8-35 (all partially)**  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
See supplemental box
  
3.  Claims Nos :  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

### Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

#### Remark on Protest

The additional search fees were accompanied by the applicant's protest.  
 No protest accompanied the payment of additional search fees.

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**Supplemental Box**

(To be used when the space in any of Boxes I to VIII is not sufficient)

**Continuation of Box No:**

Claims 1-4 and 8-35 (all partially) do not define the matter for which protection is sought in terms of the technical features of the invention (Rule 6.3(a)).

The independent claims 1, 4, 34, 35 and 36 broadly encompass any chemical reaction involving the 'collapse' of an emulsion wherein a reactant is found in one or other phase of the emulsion. *Prima facie*, the claims therefore encompass, *inter alia*, well known chemical techniques such as 'emulsion polymerisation'\*

The specification, when read as a whole, indicates that the invention relates to the use of the described methods in nucleic acid sequencing and amplification reactions. The specification only exemplifies reactions involving the amplification or sequencing of nucleic acids. Therefore, the claims have been searched to the extent that they are limited to reactions involving sequencing, amplification or other manipulations of nucleic acids.

\* Polymer Science Dictionary, Alger, Elsevier Applied Science, 1989.'

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Information on patent family members

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This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

| Patent Document Cited in<br>Search Report |            | Patent Family Member |          |    |            |
|---|------------|----------------------|----------|----|------------|
| WO  | 9902671    | AU                   | 81231/98 | EP | 1019496    |
|   |            | US                   | 6489103  | US | 2003124586 |
| WO  | 2002103011 | NONE                 |          |    |            |

END OF ANNEX